

**IN THE CLAIMS**

The following listing of claims is provided in accordance with 37 C.F.R. §1.121:

1. (currently amended) A computed tomography (CT) reconstruction method, the method comprising:

implementing an iterative image reconstruction process for CT metrology of an object, wherein said iterative reconstruction process utilizes ~~an accurate~~ a forward projection, ~~wherein said forward projection includes using a polychromatic x-ray acquisition model.~~

2. (cancelled).

3. (currently amended) The method of claim [[2]] 1, wherein using a polychromatic x-ray acquisition model further comprises:

decomposing a linear attenuation coefficient into a photoelectric component and a Compton scatter component; and

constraining a relative weight of said photoelectric component and said Compton scatter component based on prior material assumptions.

4. (currently amended) The method of claim 1, wherein ~~said accurate~~ forward projection includes incorporating finite x-ray beamwidth considerations, said finite x-ray beamwidth considerations including at least one of: detector point-spread function, detector aperture, detector cross-talk, focal-spot size, off-focal radiation, azimuthal blur, and detector memory effects.

5. (cancelled).

6. (cancelled).

7. (original) A method for implementing an iterative reconstruction of a computed tomography (CT) image, the method comprising:

during each of a plurality of iterations, generating a reconstructed image; constraining said reconstructed image by utilizing prior outer edge information obtained from a modality in addition to CT; transforming said reconstructed image to a projection domain so as to generate a calculated sinogram; and determining at least one of a correction image and a corrected image based on said calculated sinogram and a measured sinogram.

8. (original) The method of claim 7, wherein modality in addition to CT further comprises one of: a coordinate measuring machine (CMM), a micrometer, and a laser-based measurement system.

9. (original) The method of claim 8, further comprising:  
following the completion of said plurality of iterations, using a resulting completed reconstructed image and said prior outer edge information to generate a 3D point cloud of the CT image.

10. (original) The method of claim 7, wherein said generating a reconstructed image is implemented through at least one of: an iterative filtered back projection (FBP) algorithm, a maximum a posteriori probability (MAP) algorithm, a maximum likelihood (ML) algorithm, an algebraic reconstruction technique (ART) algorithm, an entropy-based algorithm, a least squares (LS) algorithm and a penalized weighted least squares (PWLS) algorithm.

11. (currently amended) A method for implementing an iterative reconstruction of a computed tomography (CT) image, the method comprising:
  - during each of a plurality of iterations, generating a reconstructed image;
  - constraining said reconstructed image utilizing prior outer edge information obtained from a modality in addition to CT and transforming said reconstructed image to the projection domain so as to generate a calculated sinogram; and
  - determining at least one of a correction image or a corrected image based on said calculated sinogram and a measured sinogram;

wherein the iterative reconstruction utilizes ~~an accurate~~ a forward projection in determining said calculated sinogram.
12. (original) The method of claim 11, wherein said modality in addition to CT further comprises one of: a coordinate measuring machine (CMM), a micrometer, and a laser-based measurement system.
13. (original) The method of claim 12, further comprising:
  - following the completion of said plurality of iterations, using a resulting completed reconstructed image and said prior outer edge information to generate a 3D point cloud of the CT image.
14. (original) The method of claim 11, wherein said generating a reconstructed image is implemented through at least one of: an iterative filtered back projection (IFBP) algorithm, a maximum a posteriori probability (MAP) algorithm, a maximum likelihood (ML) algorithm, an algebraic reconstruction technique (ART) algorithm, an entropy-based algorithm, a least Squares (LS) algorithm and a penalized weighted least squares (PWLS) algorithm.

15. (currently amended) The method of claim 11, wherein said ~~accurate~~ forward projection includes using a polychromatic x-ray acquisition model.

16. (original) The method of claim 15, wherein using a polychromatic x-ray acquisition model further comprises:

decomposing a linear attenuation coefficient into a photoelectric component and a Compton scatter component; and

constraining a relative weight of said photoelectric component and said Compton scatter component based on prior material assumptions.

17. (currently amended) The method of claim 11, wherein said ~~accurate~~ forward projection includes incorporating finite x-ray beamwidth considerations, said finite x-ray beamwidth considerations including at least one of detector point-spread function, detector aperture, detector cross-talk, focal-spot size, off-focal radiation, azimuthal blur, and detector memory effects.

18. (currently amended) The method of claim 11, wherein said ~~accurate~~ forward projection includes incorporating scattered radiation considerations.

19. (currently amended) A storage medium, comprising:

a machine readable computer program code for implementing an iterative reconstruction of a computed tomography (CT) image; and

instructions for causing a computer to implement a method, the method further comprising:

during each of a plurality of iterations, generating a reconstructed image;

modifying said reconstructed image by utilizing prior outer edge information obtained from a modality in addition to CT;

transforming said modified, reconstructed image to a projection domain so as to generate a calculated sinogram; and

determining at least one of a correction image and a corrected image based on said calculated sinogram and a measured sinogram;

wherein the iterative reconstruction utilizes ~~accurate~~ forward projection constraints in determining said calculated sinogram

20. (new) A computed tomography (CT) reconstruction method, the method comprising:

implementing an iterative image reconstruction process for CT metrology of an object, wherein said iterative reconstruction process utilizes prior outer edge information obtained from a modality in addition to CT.